FIG. 1

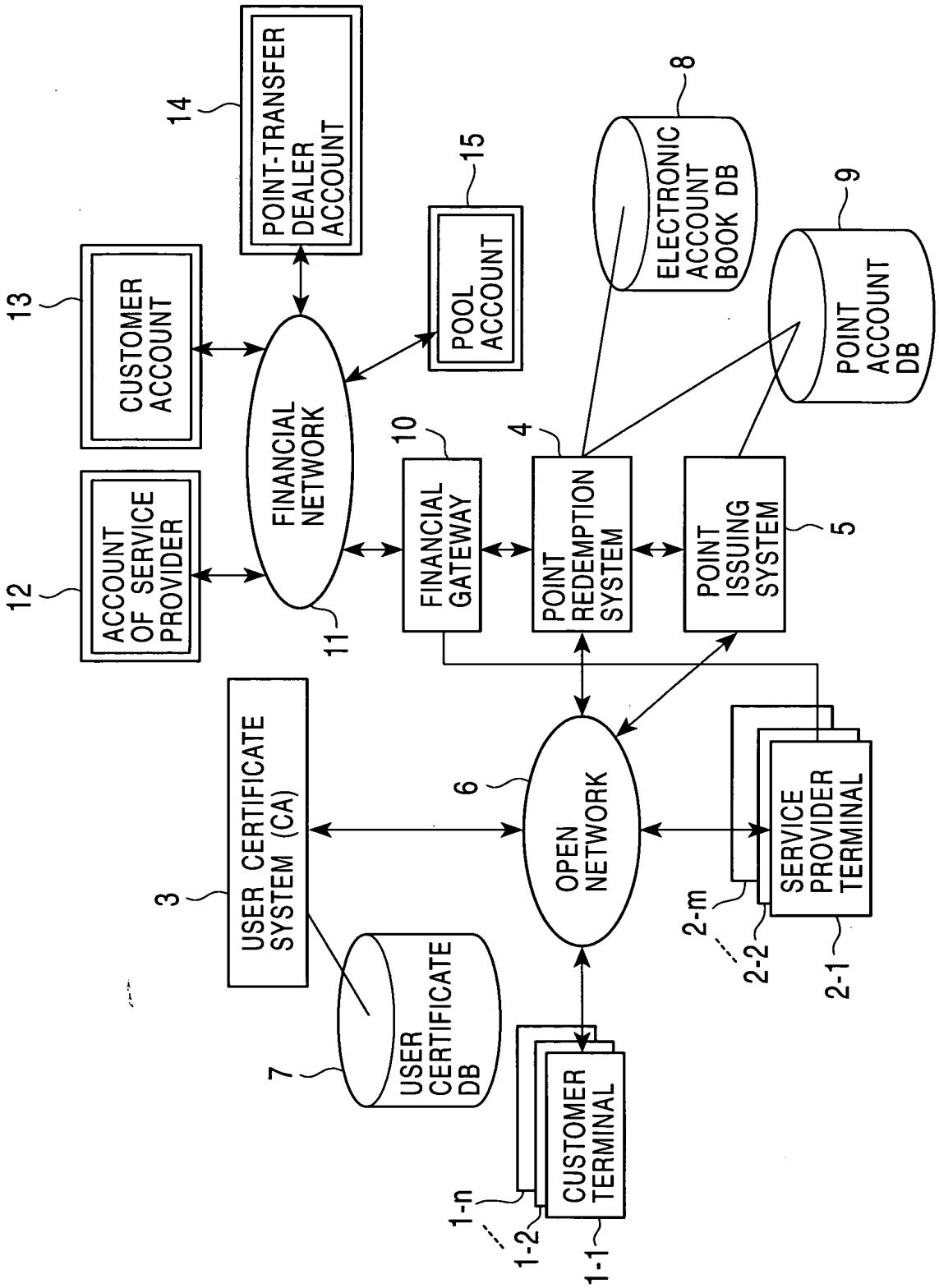
POINT-TRANSFER DEALER ACCOUNT
14
ELECTRONIC ACCOUNT BOOK DB
8
POOL ACCOUNT
15
POINT ACCOUNT DB
9
CUSTOMER ACCOUNT
13
FINANCIAL NETWORK
ACCOUNT OF SERVICE PROVIDER
12
11
FINANCIAL GATEWAY
10
POINT REDEMPTION SYSTEM
4
POINT ISSUING SYSTEM
5
USER CERTIFICATE SYSTEM (CA)
3
OPEN NETWORK
6
SERVICE PROVIDER TERMINAL
2-m
2-2
2-1
USER CERTIFICATE DB
7
CUSTOMER TERMINAL
1-n
1-2
1-1

FIG. 2

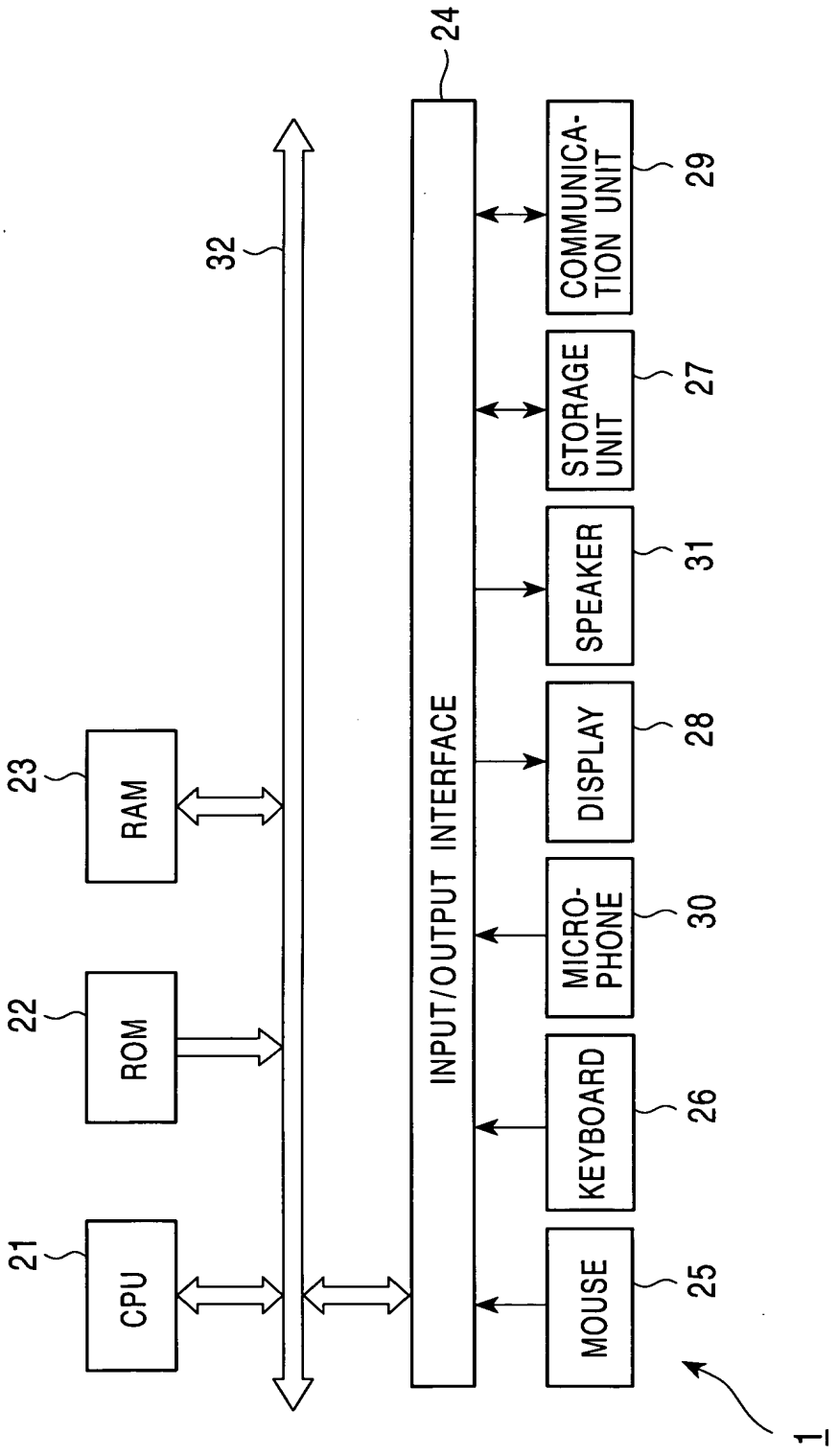
21
CPU
22
ROM
23
RAM
32
24
INPUT/OUTPUT INTERFACE
25
MOUSE
26
KEYBOARD
30
MICRO-PHONE
28
DISPLAY
31
SPEAKER
27
STORAGE UNIT
29
COMMUNICA-TION UNIT
1

FIG. 3

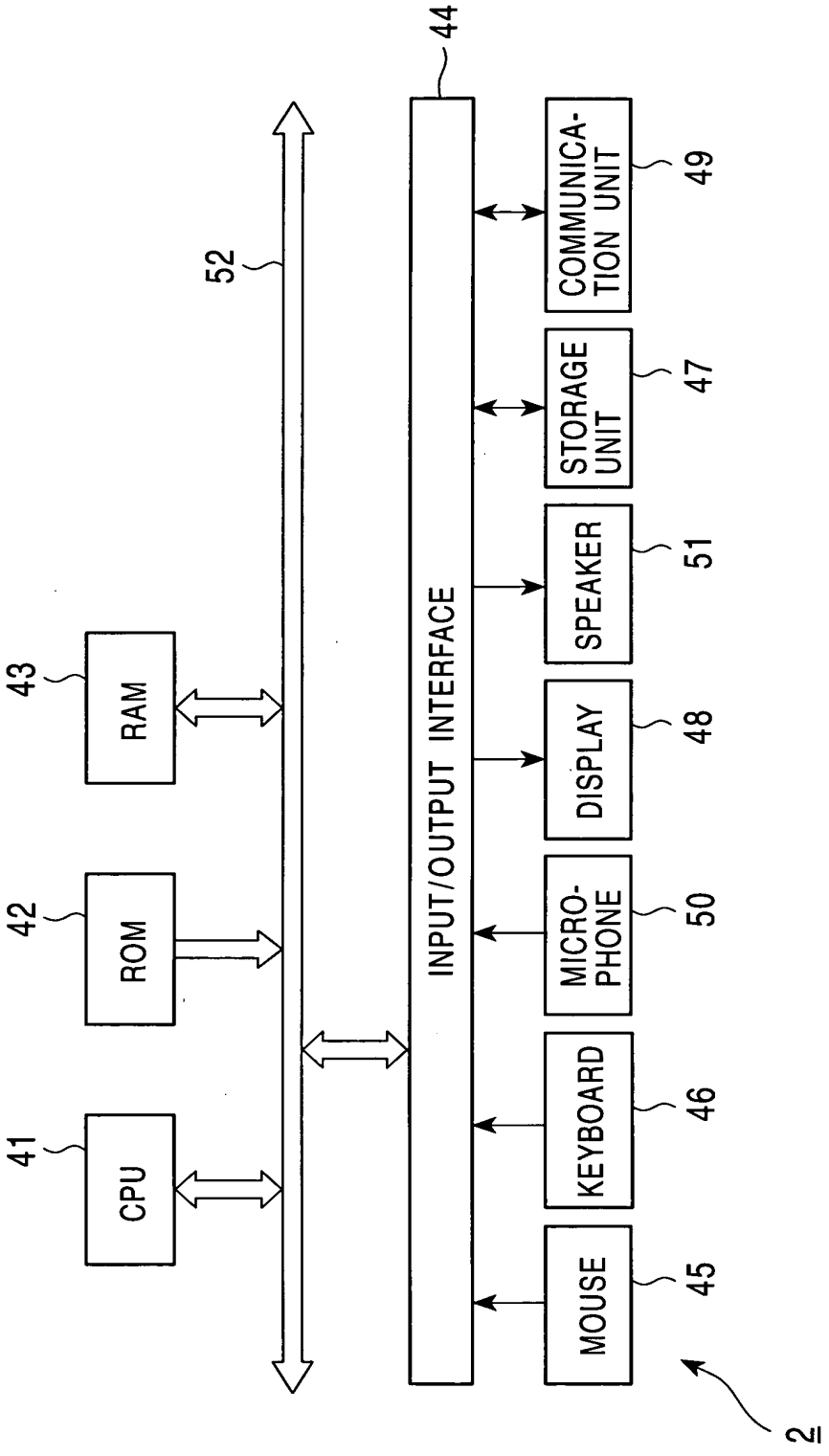
41
CPU
42
ROM
43
RAM
52
44
INPUT/OUTPUT INTERFACE
45
MOUSE
46
KEYBOARD
50
MICRO-PHONE
48
DISPLAY
51
SPEAKER
47
STORAGE UNIT
49
COMMUNICA-TION UNIT
2

FIG. 4

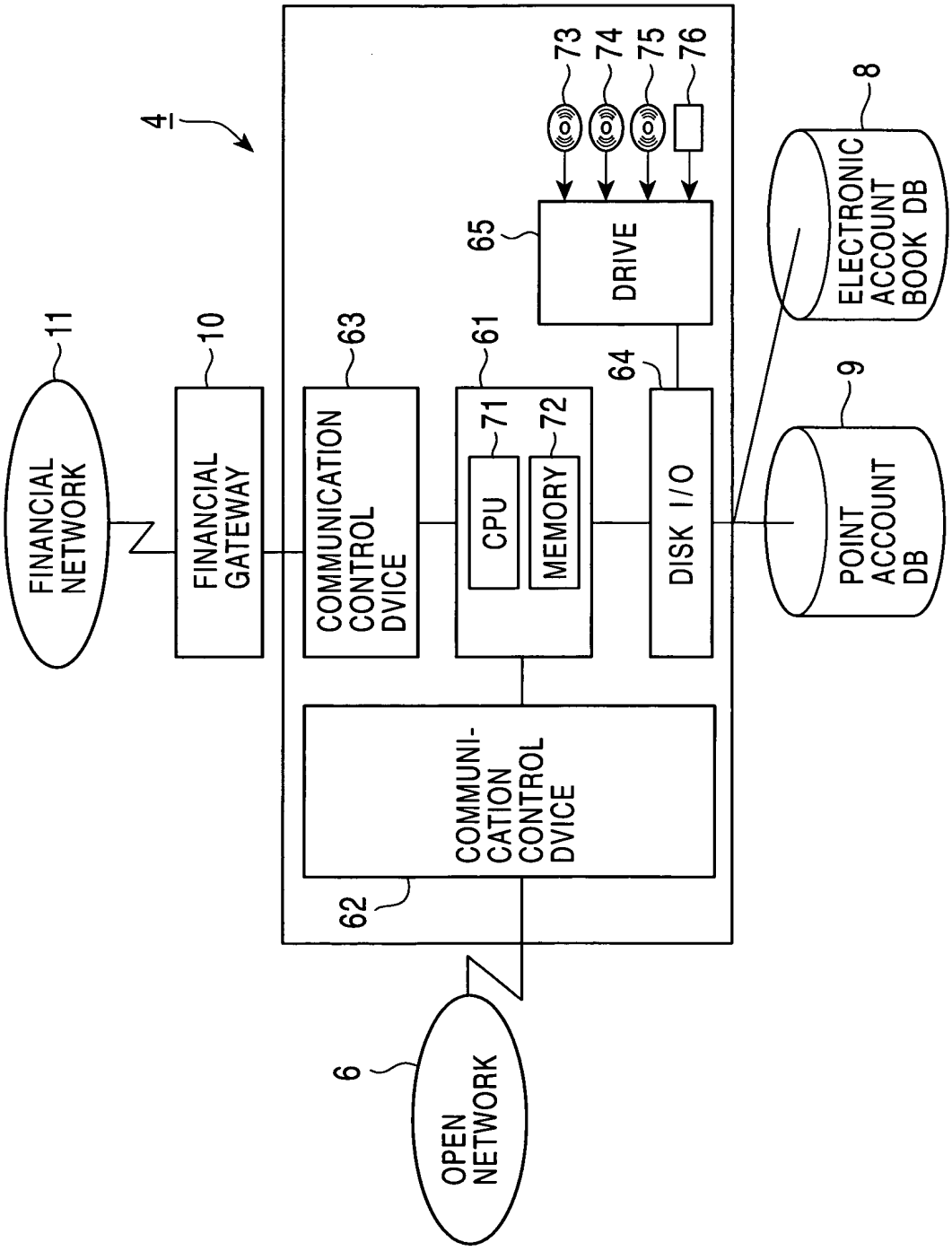
4
11
FINANCIAL NETWORK
10
FINANCIAL GATEWAY
63
COMMUNICATION CONTROL DVICE
61
CPU
71
MEMORY
72
64
DISK I/O
65
DRIVE
73
74
75
76
8
ELECTRONIC ACCOUNT BOOK DB
9
POINT ACCOUNT DB
62
COMMUNI-CATION CONTROL DVICE
6
OPEN NETWORK

FIG. 5

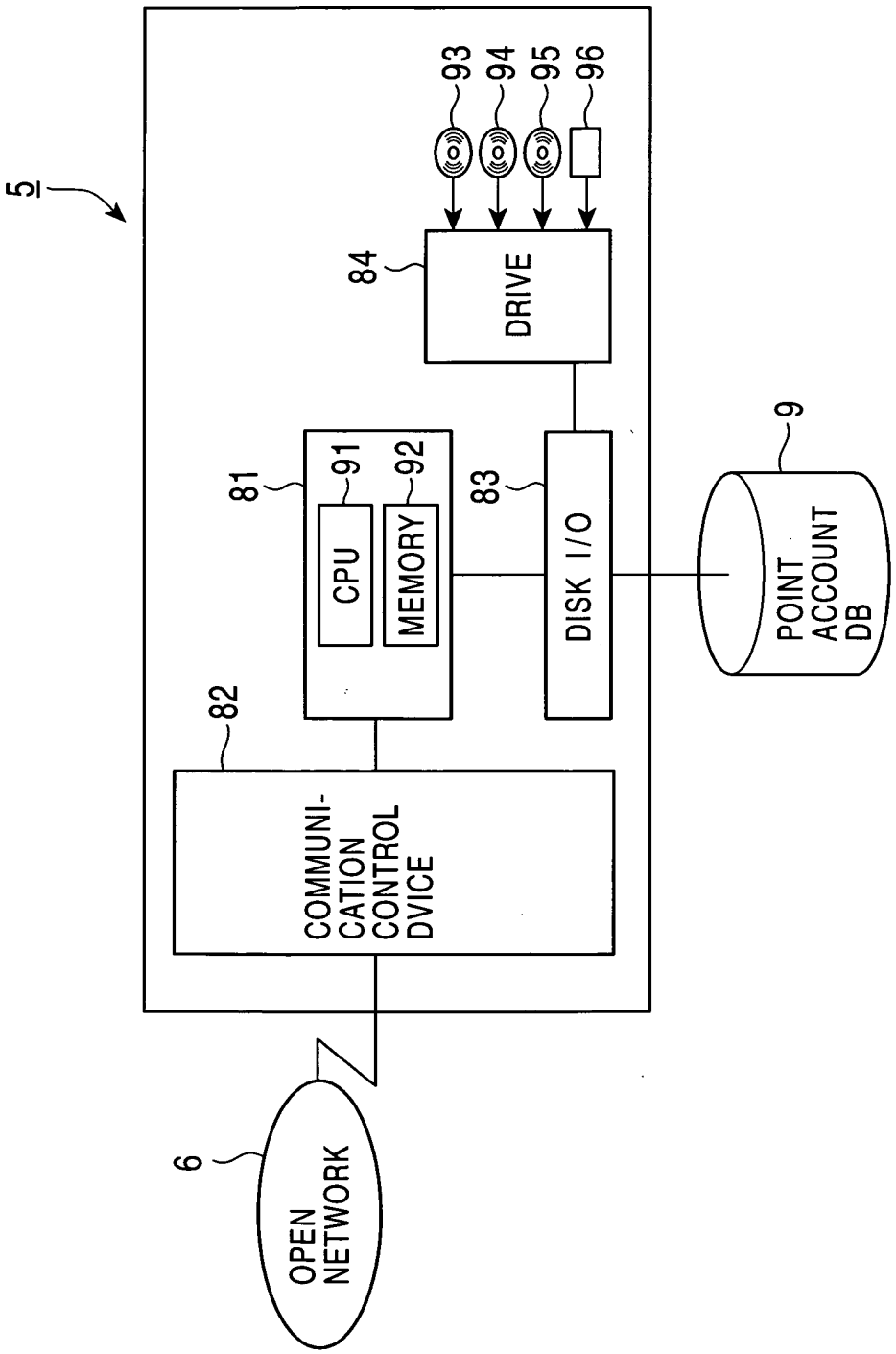
5
93
94
95
96
84
DRIVE
81
91
92
CPU
MEMORY
83
DISK I/O
9
POINT ACCOUNT DB
82
COMMUNI-CATION CONTROL DVICE
6
OPEN NETWORK

FIG. 6

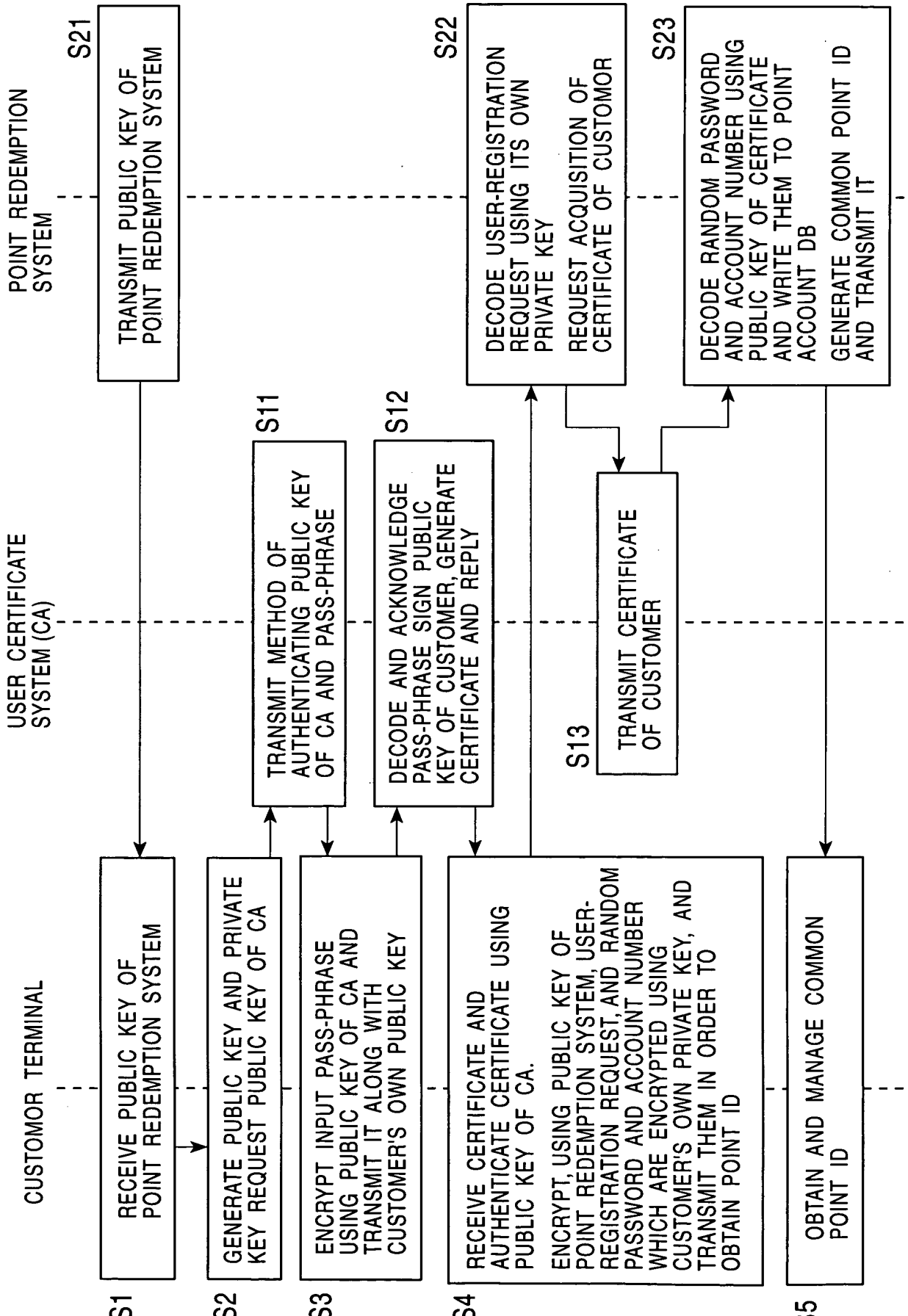
CUSTOMOR TERMINAL
USER CERTIFICATE SYSTEM (CA)
POINT REDEMPTION SYSTEM
S1
RECEIVE PUBLIC KEY OF POINT REDEMPTION SYSTEM
S2
GENERATE PUBLIC KEY AND PRIVATE KEY REQUEST PUBLIC KEY OF CA
S11
TRANSMIT METHOD OF AUTHENTICATING PUBLIC KEY OF CA AND PASS-PHRASE
S3
ENCRYPT INPUT PASS-PHRASE USING PUBLIC KEY OF CA AND TRANSMIT IT ALONG WITH CUSTOMER'S OWN PUBLIC KEY
S12
DECODE AND ACKNOWLEDGE PASS-PHRASE SIGN PUBLIC KEY OF CUSTOMER, GENERATE CERTIFICATE AND REPLY
S4
RECEIVE CERTIFICATE AND AUTHENTICATE CERTIFICATE USING PUBLIC KEY OF CA.
ENCRYPT, USING PUBLIC KEY OF POINT REDEMPTION SYSTEM, USER-REGISTRATION REQUEST, AND RANDOM PASSWORD AND ACCOUNT NUMBER WHICH ARE ENCRYPTED USING CUSTOMER'S OWN PRIVATE KEY, AND TRANSMIT THEM IN ORDER TO OBTAIN POINT ID
S5
OBTAIN AND MANAGE COMMON POINT ID
S21
TRANSMIT PUBLIC KEY OF POINT REDEMPTION SYSTEM
S22
DECODE USER-REGISTRATION REQUEST USING ITS OWN PRIVATE KEY
REQUEST ACQUISITION OF CERTIFICATE OF CUSTOMOR
S13
TRANSMIT CERTIFICATE OF CUSTOMER
S23
DECODE RANDOM PASSWORD AND ACCOUNT NUMBER USING PUBLIC KEY OF CERTIFICATE AND WRITE THEM TO POINT ACCOUNT DB
GENERATE COMMON POINT ID AND TRANSMIT IT

FIG. 7

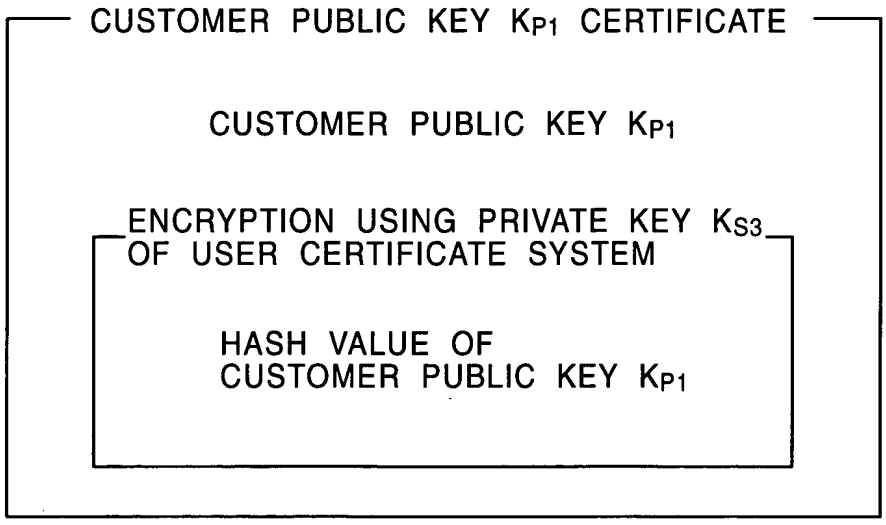
CUSTOMER PUBLIC KEY K_{P1} CERTIFICATE
CUSTOMER PUBLIC KEY K_{P1}
ENCRYPTION USING PRIVATE KEY K_{S3} OF USER CERTIFICATE SYSTEM
HASH VALUE OF CUSTOMER PUBLIC KEY K_{P1}

FIG. 8

ENCRYPTION USING PUBLIC KEY K_{P4} OF POINT REDEMPTION SYSTEM
• USER-REGISTRATION REQUEST
ENCRYPTION USING CUSTOMER PRIVATE KEY K_{S1}
• RANDOM PASSWORD
• USER ACCOUNT NUMBER
101
111

FIG. 9

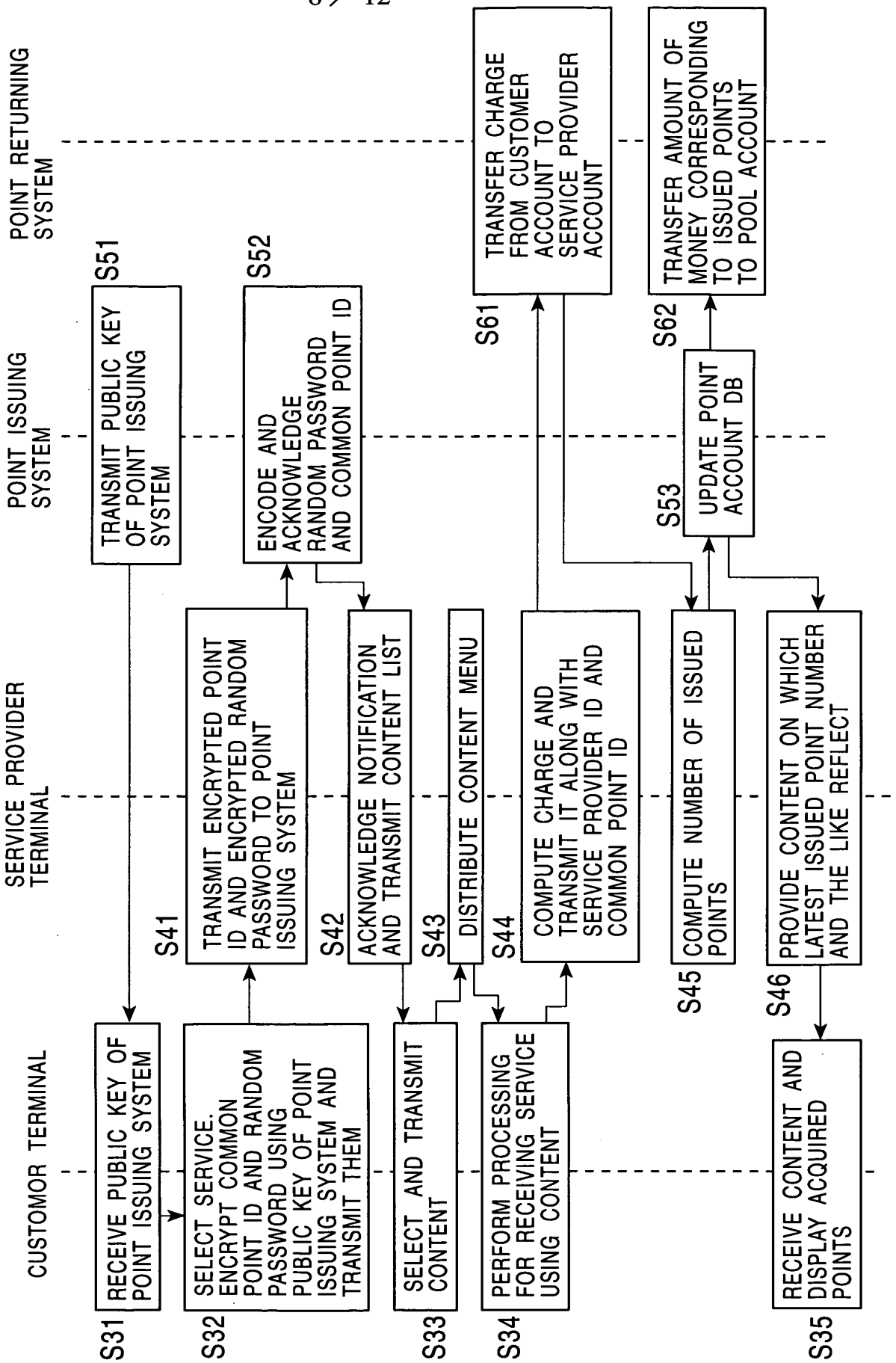
CUSTOMOR TERMINAL
SERVICE PROVIDER TERMINAL
POINT ISSUING SYSTEM
POINT RETURNING SYSTEM
RECEIVE PUBLIC KEY OF POINT ISSUING SYSTEM
SELECT SERVICE, ENCRYPT COMMON POINT ID AND RANDOM PASSWORD USING PUBLIC KEY OF POINT ISSUING SYSTEM AND TRANSMIT THEM
SELECT AND TRANSMIT CONTENT
PERFORM PROCESSING FOR RECEIVING SERVICE USING CONTENT
RECEIVE CONTENT AND DISPLAY ACQUIRED POINTS
TRANSMIT PUBLIC KEY OF POINT ISSUING SYSTEM
TRANSMIT ENCRYPTED POINT ID AND ENCRYPTED RANDOM PASSWORD TO POINT ISSUING SYSTEM
ENCODE AND ACKNOWLEDGE RANDOM PASSWORD AND COMMON POINT ID
ACKNOWLEDGE NOTIFICATION AND TRANSMIT CONTENT LIST
DISTRIBUTE CONTENT MENU
COMPUTE CHARGE AND TRANSMIT IT ALONG WITH SERVICE PROVIDER ID AND COMMON POINT ID
COMPUTE NUMBER OF ISSUED POINTS
PROVIDE CONTENT ON WHICH LATEST ISSUED POINT NUMBER AND THE LIKE REFLECT
TRANSFER CHARGE FROM CUSTOMER ACCOUNT TO SERVICE PROVIDER ACCOUNT
UPDATE POINT ACCOUNT DB
TRANSFER AMOUNT OF MONEY CORRESPONDING TO ISSUED POINTS TO POOL ACCOUNT
S31
S32
S33
S34
S35
S41
S42
S43
S44
S45
S46
S51
S52
S53
S61
S62

FIG. 10A

SERVICE PROVIDER ID	FINANCIAL INSTITUTION ID	ACCOUNT NUMBER
0001	0003	5671234

FIG. 10B

COMMON POINT ID	PASS-WORD	FINANCIAL INSTITUTION ID	ACCOUNT NUMBER	NUMBER OF ACQUIRED POINTS	DATE OF ACQUISITION EXPIRING DATE	EXPIRY DATE	SERVICE PROVIDER ID	REDEMPTION RATE
100001001	XXXXXX	0002	1234567	500	19990801	20000731	0001	0.8

FIG. 11

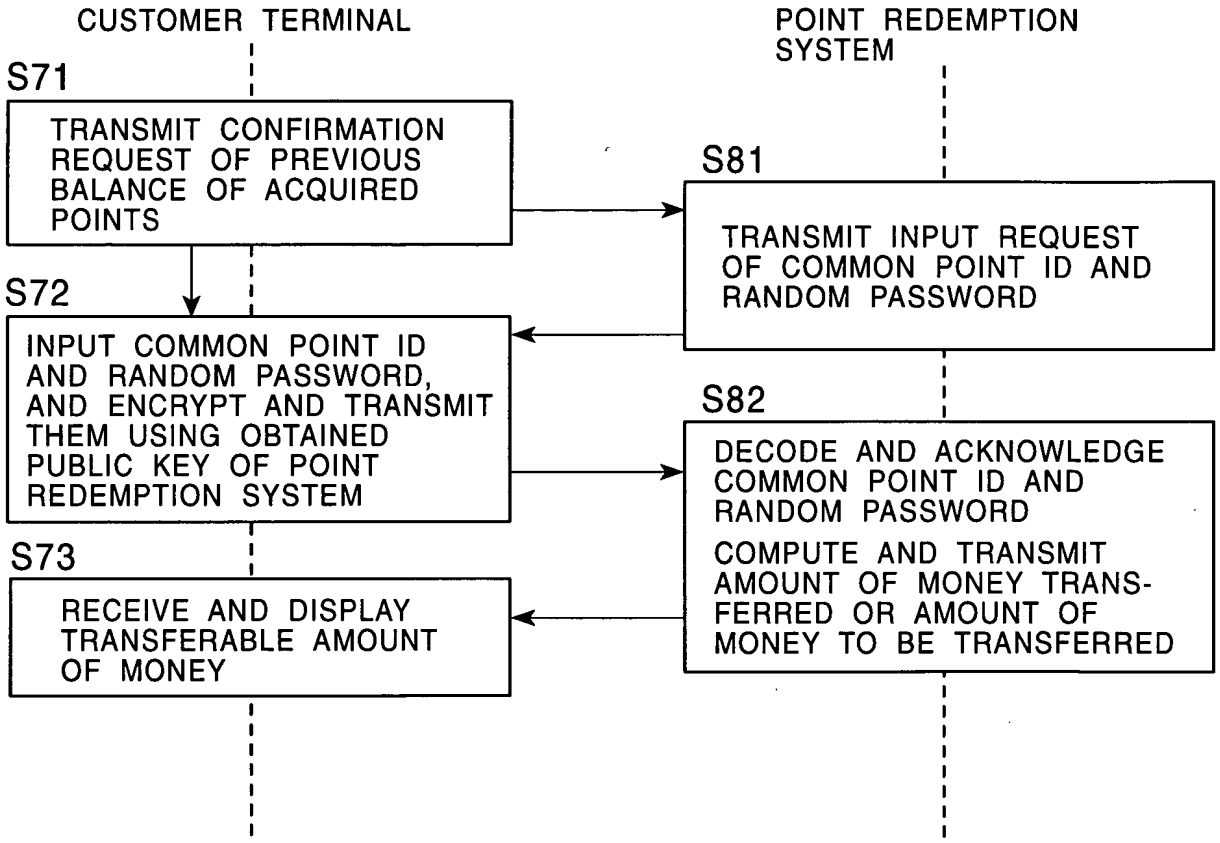
CUSTOMER TERMINAL
POINT REDEMPTION SYSTEM
S71
TRANSMIT CONFIRMATION REQUEST OF PREVIOUS BALANCE OF ACQUIRED POINTS
S81
TRANSMIT INPUT REQUEST OF COMMON POINT ID AND RANDOM PASSWORD
S72
INPUT COMMON POINT ID AND RANDOM PASSWORD, AND ENCRYPT AND TRANSMIT THEM USING OBTAINED PUBLIC KEY OF POINT REDEMPTION SYSTEM
S82
DECODE AND ACKNOWLEDGE COMMON POINT ID AND RANDOM PASSWORD
COMPUTE AND TRANSMIT AMOUNT OF MONEY TRANSFERRED OR AMOUNT OF MONEY TO BE TRANSFERRED
S73
RECEIVE AND DISPLAY TRANSFERABLE AMOUNT OF MONEY

FIG. 12

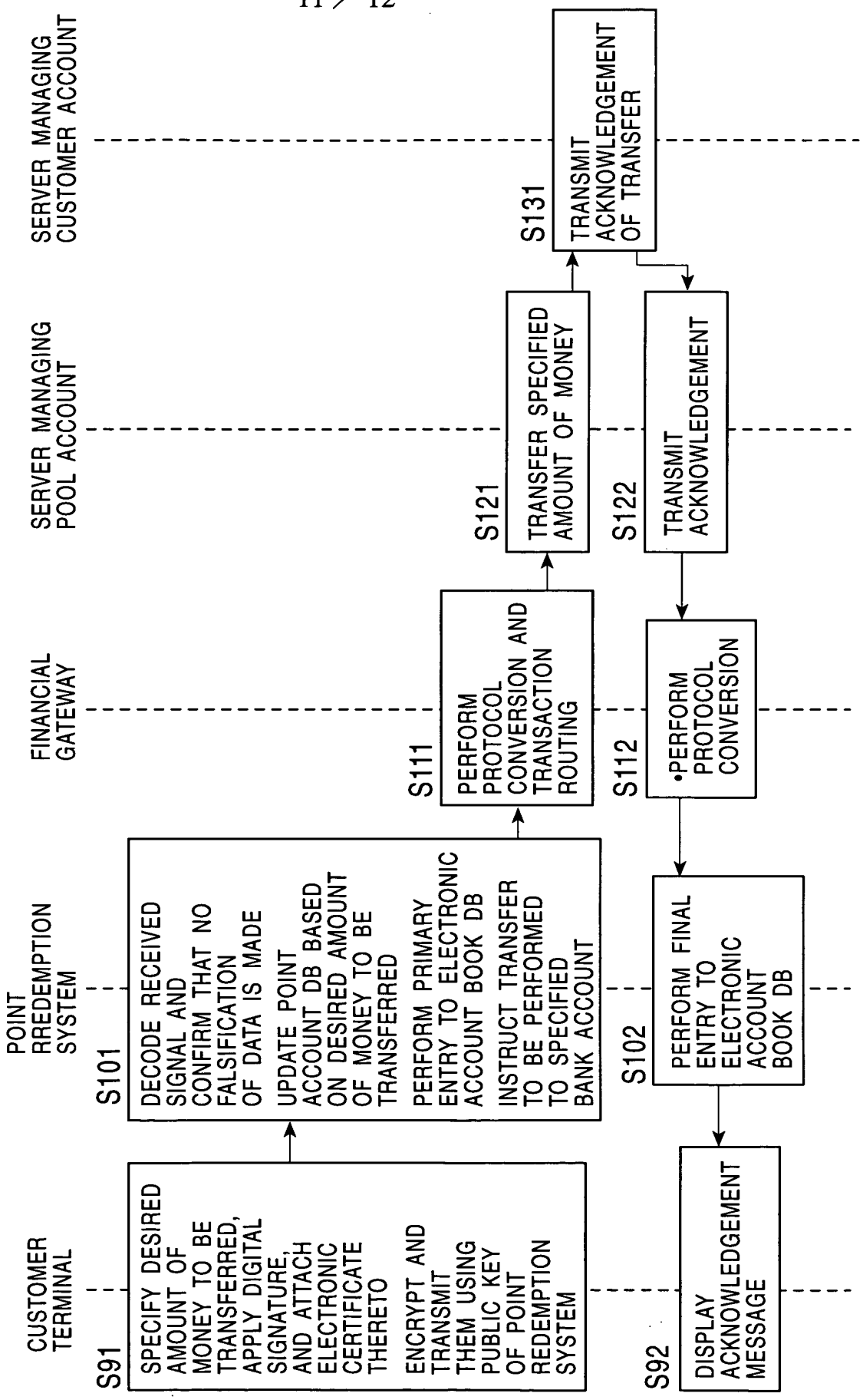
CUSTOMER TERMINAL
POINT RREDEMPTION SYSTEM
FINANCIAL GATEWAY
SERVER MANAGING POOL ACCOUNT
SERVER MANAGING CUSTOMER ACCOUNT
S91
SPECIFY DESIRED AMOUNT OF MONEY TO BE TRANSFERRED, APPLY DIGITAL SIGNATURE, AND ATTACH ELECTRONIC CERTIFICATE THERETO
ENCRYPT AND TRANSMIT THEM USING PUBLIC KEY OF POINT REDEMPTION SYSTEM
S101
DECODE RECEIVED SIGNAL AND CONFIRM THAT NO FALSIFICATION OF DATA IS MADE
UPDATE POINT ACCOUNT DB BASED ON DESIRED AMOUNT OF MONEY TO BE TRANSFERRED
PERFORM PRIMARY ENTRY TO ELECTRONIC ACCOUNT BOOK DB
INSTRUCT TRANSFER TO BE PERFORMED TO SPECIFIED BANK ACCOUNT
S111
PERFORM PROTOCOL CONVERSION AND TRANSACTION ROUTING
S121
TRANSFER SPECIFIED AMOUNT OF MONEY
S131
TRANSMIT ACKNOWLEDGEMENT OF TRANSFER
S122
TRANSMIT ACKNOWLEDGEMENT
S112
•PERFORM PROTOCOL CONVERSION
S102
PERFORM FINAL ENTRY TO ELECTRONIC ACCOUNT BOOK DB
S92
DISPLAY ACKNOWLEDGEMENT MESSAGE

FIG. 13

COMMON POINT ID	CUMULATIVE POINTS BEFORE TRANSFER	TRANSFER DATE	POINTS TRANS-FERRED	REMAINING POINTS
100001001	16500	19990830	15000	1500

FIG. 14

PRIMARY ENTRY DATE	FINAL ENTRY DATE	COMMON POINT ID	POINTS TRANS-FERRED	AMOUNT OF MONEY TRANS-FERRED	REDEMPTION RATE
19990529	19990530	100001013	10000	8000	0.8
19990530	19990531	100001021	5000	4000	0.8